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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	:	Afzali-Ardakani et al.
Serial No.	:	08/118,475
Filed On	:	September 7, 1993
For	:	ELECTRICALLY CONDUCTIVE POLYMERIC MATERIALS AND USE THEREOF.
Examiner	:	B. Swope
Group Art Unit	:	1105

Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

DECLARATION UNDER 37 C.F.R. §1.132

Dear Sir:

MARIE ANGELOPOULOS declares as follows:

1. I am one of the inventors of the subject matter of the above-identified patent application.

2. I received a Bachelor of Arts degree in Chemistry in 1982 from Rutgers, the State University. In 1988, I was awarded the degree of Doctor of Philosophy in Chemistry from the University of Pennsylvania.

3. From 1987 to date, I have been employed by the International Business Machines Company, Thomas J. Watson Research Center, Yorktown Heights, New York, assignee of the above-identified application. My present position is Research Staff Member, Advanced Polymer Materials.

4. I have reviewed the Office Action dated September 1, 1994 from the United States Patent Office Examiner relating to the above-identified application.

5. In the aforementioned Office Action, the Examiner has rejected Claims 53-81 as being unpatentable over each of United States Patents 4,933,106 to Sakai et al., 4,940,517 to Wei, 5,068,060 to Jen et al. or 4,771,111 to Tieke et al. In the Office Action the Examiner has stated:

"The present claims are drawn to an electrically conductive composition containing an electrically conductive polymer and a polymer dopant, the method of making such a composition and articles formed therefrom. The electrically conductive polymer and the polymer dopant can be selected from lists of well known conductive polymers and well known polymer dopants. Each of the references listed above teach (sic) an electrically conductive composition containing an electrically conductive polymer and a polymer dopant as taught by applicant. Each reference teaches at least one embodiment of applicant's invention. While some of applicant's dependent claims recite a specific conductive polymer with a specific dopant, nothing unobvious is seen in merely selecting a conductive polymer and a polymer dopant from the lists of materials that are taught by the prior art.

Sakai discloses an electrically conductive composition, and method of making such, comprising a conductive polymer and a polymer dopant, which can be the same as those presently claimed. See columns 2 and 3. For example Sakai teaches polypyrrole and polythiophene as polymers and teaches polyacrylic acid, polysulfonic acids and acids containing carboxylic groups as dopants. It would have been prima facie obvious for one skilled in the art to make an electrically conductive composition out of any combination of these polymers and dopants as Sakai clearly suggests that such may be done.

Wei discloses an electrically conductive composition, and method of making such, comprising polyaniline and a polymer dopant. The dopant can be polysulfonic acid or polyacrylic acid.

Jen discloses an electrically conductive composition, and a method of making such, comprising a polymer (heterocyclic vinylene) and a polymer dopant. The dopant can be by polyacrylic acid and those containing carboxylic acid or sulfonic acid groups. See abstract and column 14, lines 57-65.

Tieke discloses an electrically conductive composition comprising a mixture of polyimide and polypyrrole. See abstract examples.

While all of the references do not contain a specific example teaching an electrically conductive polymer and a polymer dopant, the suggestion to do so is clearly suggested in each patent. The skilled artisan would simply expect that the polymer dopants would produce results similar in degree to the other dopants listed and specifically demonstrated. Nothing unobvious is seen in doing so. Additionally, note that each reference teaches the shaping of the polymer material into useful articles."

6. In response to an Office Action in the parent application, (referred to hereinafter as "the '386 application," now abandoned), I filed an amendment that more clearly defined the

claims by including language that clarified that the polymer blend is *--soluble in an organic solvent--*.

7. In an advisory action in response to the aforementioned amendment to the claims of the '386 application, the Examiner stated:

> "... the Examiner suggests filing the amendment in a continuation application along with a declaration showing that the prior art blends are not soluble in the organic solvent that the present invention is."

8. The continuation application was filed and is the instant application.

9. Under my direction and control, numerous samples were prepared under conditions as set forth in the examples disclosed in the specification of the present invention. According to the teaching of the present invention, solutions of conductive polymers were prepared by forming first solutions of precursor polymers to the conductive polymers in a solvent, and forming second solutions of dopants, each in a solvent. Each of the first and second solution samples were combined. In each trial, the dopant dopes the precursor to the conductive polymers which in each case remains in solution in the combined solvent.

10. It is my opinion that if the doped polymers of the present invention were to be synthesized by the methods disclosed in United States Patents 4,933,106 to Sakai et al., 4,940,517 to Wei, 5,068,060 to Jen et al. or 4,771,111 to Tieke et al., (which are basically *in-situ* polymerizations of the monomer in the polyacid), the conducting polymer blend will precipitate out of solution as a powder.

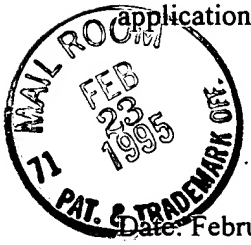
11. I have found experimentally that once the polymer precipitates out in this fashion, it does not subsequently dissolve to any appreciable extent in an organic solvent.

12. I have determined that with respect to the present invention, at no time does the conducting polymer blend precipitate from solution. That is, the precursor polymer (the conducting polymer in undoped form) and the polyacid are both soluble in a given solvent. The reaction of the two is carried out in solution, and the product, which is the conducting polymer remains soluble in the given solvent. This result is clearly different from and unobvious in view of the prior art.

13. The Examiner has recently cited United States Patent 5,006,278 to Elsenbaumer and applied it in combination with the reference noted above to Sakai et al.

14. I have reviewed the Elsenbaumer reference and find that it is not pertinent. Elsenbaumer teaches solutions of polyaniline with an oxidizing dopant; however the dopant is not a polyacid, but is in fact a collection of compounds possessing small molecules.

15. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true: and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.



Date: February 21, 1995

MARIE ANGELOPOULOS

MAILING CERTIFICATE
Date of Deposit: February 21 , 1995
I hereby certify that this amendment with fee is being deposited with the United States Postal Service under 37 CFR §1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231
Thomas A. Beck
Person Mailing

Signature